

1/5

7A5-scFv

5'UTR-5'UTR Leader
1 TCCACCCTCTCTCACTCAGAGAAAGCTCTCTGACACCAAGAGAGA ATG GAC TGT CTC ACC AAC CTC CGA TCC 70
1 M D C L T N L R S 9
71 GCT GAG GGT AAA GTT GAC CAG GCG AGC AAA ATC CTA ATT CTC CTT GTG GCT TGG TGG GGG 130
10 A E G K V D Q A S E I L I L L V A W W G 29
131 TTT GGG ACC ACT GCG GAA GTT TCG ACT GCG CGA GCG GCG CAG CCG GCG ATG GCG CAG GTC 190
30 F G T T A E V S T A H A A Q P A M A N V 49
191 AAG CTG CAG CAG TCA GGG GCT GAG CTG GTG AGC CCT GCG CTC TCA GTG AAG ATT TCC TGC 250
50 K L Q Q S G A H L V R P G V S V K I S C 69
251 AAG GGT TCT GCG TAC ACA TTC ACT GAT TAT GGT ATG AGC TGG GTG AAA CAG AGT CAT GCA 310
70 K G S G Y T Y T D Y G M S W V X Q S H A 89
311 AAG AGT CTA GAG TGG ATT GGA CTT ATT AGT ACT TAC TAT GGT CAT CCT AGT TAC AAC CAG 370
90 K S L H W I G L I S T Y Y G D P S Y N Q 109
371 AAG TTC AAG GGC AAG GCG ACA ATG ACT GTA GAC AAA TCC TCC AAC ACA GCG TAT TTG GAA 430
110 R F K G K A T E T V D E S S N T A Y L E 129
431 CTT GCG AGA CTG ACA TCT GAG GAT TCT GCG ATT TAT TAT TGT GCA AGA TCG GAT GGT AAT 490
130 L A R L T S N D S A I Y Y C A E S D G H 149
491 TAC GCG TAT TAC TAT GCT TTG GAC TAC TGG GCG CAA GCG ACT ACG GTC ACC GTC TCC TCA 550
150 Y G Y Y Y A L D Y W G Q G T T V T V S S 169
551 GGT GGA GCG GGT TCA GCG GGA GGT GCG TCT GCG GGT GCG GGA TCG GAT ATC GAG CTC ACT 610
170 G G G G S G G G G G S D I E L T 189
611 CAG TCT CCA TCT TCT TTG GCT GTG TCT CTA GCG CAG AGC GCG ACC ATA TCC TCC AGA GCG 670
190 Q S P S S L A V S L G Q R A T I S C R A 209
671 AGT GAA AGT GTT GAT AGT TAT GCG GAT AGT TTT ATG CAC TCG TAT CAG CAG AAA CCA GGA 730
210 S H S V D S T G D S F M E W Y Q Q K P G 229
731 CAG CCA CCC AAA CTC CTC ATC TAT GGT GCA TCC AAC CTA GAA TCT GGA GTC CCT GCG AGG 790
230 Q F P K L L I Y R A S N L E S G V P A R 249
791 TTC AGT GCG AGT GCG TCT GAG TCA GAC TTC ACT CTC ACC ATC GAT CCT GTG GAG GAA GAT 850
250 F S G S G S E S D F T L T I D P V H E D 269
851 GAT GCT GCA GTG TAT TAC TGT CTG CAA AGT ATG GAA GAT CCG TAC ACG TTC GGA GCG GCG 910
270 D A A V Y Y C L Q S M E D F Y T F G G G 289
911 ACC AAG CTG GAA ATA AAA CCG GCG GCG GCA TCG GCG TCC GCG GCG GGT GGT TCT GGT GGT 970
290 T K L H I K R A A A S G S G G G G S G G 309
971 GGT TCT GGT GGT GGT GGT TCT GGT GGT GGT TCT GCG GCG AGC CCA GTC CAG TTT ATC 1030
310 G S G G G G S G G G G S G A S P V Q E I 329

Fig. 1

Matter No.: 11692-006US1
 Applicant(s): Klaus Cichutek et al.
 GENE TRANSFER IN HUMAN LYMPHOCYTES USING
 RETROVIRAL SCFV CELL TARGETING

2/5

K6-scFv

SNV-env Leader
 ATG GAC TGT CTC ACC AAC CTC CCA TCC 27
 M D C L T N L R S 9

1
 1

28 GCT GAG GGT AAA GTT CAC CAG GCG AGC AAA ATC CTA ATT CTC CTT GCG GCT TCG TCG GCG 87
 10 A E G K V D Q A S K I L L L V A W W C 29

88 TTT GCG ACC ACT GCC CAA GTT TCG ACT GCC CCA GCG GCG CCG GCC ATG GCC GAG GTC 147
 30 F G T T A E V S T A R A A Q P A M A E V 49

148 AAC CTC CAG CAG TCA GCG ACT CAA CTT GTG AAC CTT GCG GCT TCA GTG AAT CTC TCT TCG 207
 50 K L Q E S G T E L V K P G A S V N L S C 69

208 AAC GCT TCT GCC TAC ACC TTC ACC AGC TAC TCG ATC CAC TCG TTG AAG CAG AGC CCT GGA 267
 70 K A S G Y T F T S Y W M H W L K Q R P G 89

268 CAA GCG CTT GAG TCG ATC CCA CAG ATT GAT CTT GTT GAT AGT TAT ACT AAC TAC AAT CAA 327
 90 Q G L E W I G E I D P V D S Y T N Y N Q 109

328 AAC TTC AAG GCG AAG GCG ACA CTG ACT GTA CAC AAG TCC TCC ACC ACA CTC TAC ATG CAC 387
 110 H F K G K A T L T V D K S S T T V Y M H 129

388 CTC AGC AGC CTG ACA TCT CAG CAC TCT GCG GTC TAT TAC TGT CCA ACA AAG GCG TAT GCT 447
 130 L S S L T S E D S A V Y Y C A R K G Y A 149

448 ATG GAC TAC TCG GCG CAA GCG ACC AAC GTC ACC GTC TCC TCA GGT GGA TCC GGT TCA GCG 507
 150 M D Y W G Q G T N V T V S S S G S G S G 169

508 GGA GGT GCG TCT GCG GGT GCG GGA TCG CAC ATC CAG CTC ACT CAG TCA CCA GCA ATC ATG 567
 170 G G G S C C C G S D I E L T Q S P A I M 189

568 TCT GCA TCT CCA GCG CAG AAG GTC ACC ATG ACC TCC AGT GCG ACC TCA AGT ATA AGT TAC 627
 190 S A S P G E K V T M T C S A S S S I S Y 209

628 ATG CAC TCG TAC CAG CAG AAG CCA GCG ACC TCC CCG AAA ACA TCG ATT TAT GAC ACA TCC 687
 210 M H W Y Q Q K P C T S P K R W I Y D T S 229

688 AAA CTC GCT TCT GGA CTC CTT GCT GCG TTC AGT GCG AGT GCG TCT GCG ACC TCT TAT TCT 747
 230 K L A S G V P A R F S G S G S G T S Y S 249

748 CTC CCA ATC AGC AGC ATG CAG GCT CAA GAT GCT GCG ACT TAT TAC TCC CAT CAG CCG AGT 807
 250 L P I S S M E A E D A A T Y Y C H Q R S 269

808 AGT TAC CCA TCG AGC TTC GGT GGA GCG ACC AAG CTC GAA ATA AAA CCG CCG GCC CCA TCG 867
 270 S Y P W T F G C G T K L E I K R A A A S 289

868 GCG TCC GCG GCG GGT GGT TCT GGT GGT GGT TCT GGT GGT GGT TCT GGT GGT GGT GGT 927
 290 G S G G G G S G C G S G G G G S G G G G 309

Fig. 2

Matter No.: 11692-006US1
 Applicant(s): Klaus Cichutek et al.
 GENE TRANSFER IN HUMAN LYMPHOCYTES USING
 RETROVIRAL SCFV CELL TARGETING

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7B2-SCFV

▶ SVV-env Leader
 1 ATG GAC TGT CTC ACC AAC CTC CGA TCC GCT GAG GGT AAA GTT GAC CAG GCG AGC AAA ATC 60
 1 M D C L T H L R S A E G K V D Q A S K I 20
 61 CTA ATT CTC CTT GTG GCT TGG TGG GCG TTT GCG ACC ACT GCG GAA GTT TCG ACT GCG CGA 120
 21 L I L L V A W W G F G T T A E V S T A R 40
 ▶ 7B2-scfv
 121 GCG GCG CAG CCG GCG ATG GCG CAG CTC CAG CTC CAG CAG TCT GCG ACT GAA CTC GCA ACA 180
 41 A A Q P A M A Q V Q I Q Q S G T E L A T 60
 181 CCT GCG GCG TCA CTC AGC ATG TCC TCG AAG GCT TCT GCG TAC GCG TTT ACT ACC TAC TCG 240
 61 P G A S V R M S C K A S G Y A F T T Y W 80
 241 ATG CAC TCG GTA AAA CAG AGC CCT GGA CAG GGT CTC GAA TCG ATT GGA TAC ATT AAT CCT 300
 81 M H W V K Q R P G Q G L E W I G Y I H F 100
 301 ACC ACT GAT TAT ACT GAC TAC AAT CTC AAG TTC AAG CAC AAG GCG ACA TTG ACT GCA GAC 360
 101 T T D Y T D Y W L K F K D K A T L T A D 120
 361 AAA TCC TCC AGT ACA GCG TAC ATG CAA CTC AGC AGC CTC ACA TCT GAG CAC TCT GCA CTC 420
 121 K S S S T A Y M Q L S S L T S E D S A V 140
 421 TAT TAC TGT GCA AGA TCG GCG TCG TCG TAT GCT ATG GAC TAC TCG GCG CAA GCG ACC AGC 480
 141 Y Y C A R S G W S Y A M D Y W G Q G T T 160
 481 GTC ACC ATC TCC TCA GGT GGA GCG GGT TCA GCG GCA GGT GCG TCT GCG GGT GCG GCA TCG 540
 161 V T I S S G G G G S G G G S G G G S 180
 541 GAC ATC CAG CTC ACT CAG TCT CCA GCA ATC ATG TCT GCA TCT CCA GCG GAG AAG CTC ACC 600
 181 D I E L T Q S P A I M S A S P G E K V T 200
 601 ATA ACC TCG AGT GCG AGC TCA AGT GGA AGT TAC ATG CAC TCG TTC CAG CAG AAG CCA GCG 660
 201 I T C S A S S S V S Y M E W F Q Q K E G 220
 661 ACT TCT CCG AAA CTC TCG ATT TAT AGC ACA TCC AAC CTC GGT TCT GCA CTC CTT GCT CCG 720
 221 T S P K L W I Y S T S N L A S G V P A R 240
 721 TTC AGT GCG AGT GGA TCT GCG ACC TCT TAC TCT CTC ACA ATC AGC CCA ATG CAG GGT GAA 780
 241 F S G S G S G T S Y S L T I S R M E A E 260
 781 GAT GGT GCG ACT TAT TAC TCG CAG CAA AGC ACT AGT TAC CCA TTC AGC TTC GCG TCG GCG 840
 261 D A A T Y Y C Q Q R S S Y P E T F G S G 280
 841 ACC AAG CTC GAA ATC AAA CCG GCG GCG GCA TCG GCG TCG GCG GCG GGT GGT TCT GGT GGT 900
 281 T K L E I K R A A A S G S G G G G S G G 300
 901 GGT GGT TCT GGT GGT GGT GGT TCT GGT GGT GGT GGT TCT GCG GCG AGC CCA CTC CAG TTT 960
 301 G G S G G G G S G G G S G A S P V Q F 320
 961 ATC CCG CTC CTT GTC GGT CCA GCG ATT TCA 990
 321 I F L L V G L G I S 330

Fig. 3

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7E4-scfv

► SNV-env Leader
1 ATG GAC TGT CTC ACC AAC CTC CGA TCC GGT GAG GGT AAA GTT GAC CAG GCG AGC AAA ATC 60
1 M D C L T N L R S A E G K V D Q A S K I 20
61 CTA ATT CTC CTT GTG GCT TGG TGG GCG TTT GCG ACC ACT GCC GAA GTT TCG ACT GCC CGA 120
21 L I L L V A W W G F G T T A R V S T A R 40
121 GCG GCG CAG CCG GCG ATG GCG GAG CTC AAG CTC CAG CAG TCA GCG GGT GAG CTG GTG AGG 180
41 A A Q P A M A R V K L Q Q S G A E L V R 60
181 CCT GGA GGT TCA GTG AAG CTG TCC TGC AAG ACT TCT GCG TTC TCC TTC ACC AGC TAC TGG 240
61 F G A S V K L S C K T S G F S F T S Y W 80
241 ATG AAC TGG GTG AAG CTG AGC CCT GGA CAA GCG CTT GAG TGG ATT GCC ATG ATT CAT CTT 300
81 M N W V K L R P G Q G L E W I G M I H P 100
301 TCC CAT AGT GAA ACT AGT TTA ACT CAG AGC TTC AAG CAC AAG GCG ACA CTG ACT GTA GAC 360
101 S D S E T S L T Q R F K D K A T L T V D 120
361 AAA TCC TCC AGC ACA GCG TAC ATG CAA CTC AGC AGC CCG ACA TCT GAG CAC TCT GCG GTC 420
121 K S S S T A Y M Q L S S P T S E D S A V 140
421 TAT TAC TGT GCA AGA TCT CTT TAT GCT AAC TAC CCG TCC TGG TTT ACT TAC TGG GCG CAA 480
141 Y Y C A R S L Y A N Y P S W F T Y W G Q 160
481 GCG ACC AGC GTC ACC GTC TCC TCA GGT GGA GCG GGT TCA GCG GGA GGT GCG TCT GCG GGT 540
161 G T T V T V S S G G G G S G G G S G G 180
541 GCG GGA TCG GAC ATC GAG CTC ACT CAG TCT CCA ACC ACC ATG GGT GCA TCT CCG GCG CAG 600
181 G G S D I E L T Q S P T T M A A S P G E 200
601 AAG ATC ACT ATC ACC TGC AGT GCG AGC TCA AGT ATA AGT TCC AAT TAC TTG CAT TCG TAT 660
201 K I T I T C S A S S S I S S S N Y L H W Y 220
661 CAG CAG AAG CCA GGA TTC TCC CCT AAA CTC TTG ATT TAT AGG ACA TCC AAT CTG GGT TCT 720
221 Q Q K P G F S F K L L I Y R T S N L A S 240
721 GGA GTC CCA GGT GCG TTC AGT GCG AGT GCG TCT GCG ACC TCT TAC TCT CTC ACA ATT GCG 780
241 G V P A R F S S S G S G T S Y S L T I C 260
781 ACC ATC CAG GCT GAA GAT GTT GCG ACT TAC TAC TCC CAG CAG GGT AGT AGT ATA CCG TAC 840
261 T M E A E D V A T Y Y C Q Q G S S I P Y 280
841 ACC TTC GGA GCG GCG ACC AAG CTG CAA ATA AAA CCG GCG GCG GCA TCG GCG TCC GCG GCG 900
281 T F G G G T K L E I K R A A A S G S G G 300
901 GGT GGT TCT GGT GGT GGT GGT TCT GGT GGT GGT GGT TCT GGT GGT G 946
301 G G S G G G G S G G G G S G G 315

Fig. 4

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6C3-scFv

▶ SNV-env Leader
 1 ATG GAC TGT CTC ACC AAC CTC CCA TCC GCT CAG GGT AAA GTT GAC CAG GCG ACC AAA ATC 60
 1 M D C L T N L R S A E G K V D Q A S K I 20
 51 CCA ATT CTC CTT GTG GCT TGG TGG GCG TTT GCG ACC ACT GCC GAA GTT TCG ACT GCC CCA 120
 21 L I L L V A W W G F G T T A K V S T A R 40
 121 GCG GCC CAG CCG GCC ATG GCC CAG GTA CAG CTG CAG CAG TCA GCA GCA GAA ATG AAA AAG 180
 41 A A Q P A M A Q V Q L Q Q S G A E M K K 60
 181 CCC GCG GAG TCT CTG AAA ATC TCC TGT AAG GGT TTT GCA TAC GAC TTT ACC ACT TAC TCG 240
 61 P G E S L K I S C K G F G Y D F S T Y W 80
 241 ATC GCC TGG GTG CCG CAG ATG CCC GCG AAA GCG CTG GAG TAC ATG GCG CTC ATC TAT CCT 300
 81 I A W V R Q M P G K G L E Y M G L I Y P 100
 301 GGT CAG TCT CAC ACC AAA TAC ACC CCG TCC TTC CAA GCG CAG GTC ACC ATC TCA GCC GAC 360
 101 G D S D T K Y S P S F Q C Q V T I S A D 120
 361 AAG TCC ATC AGC ACC GCC TAC CTG CAG TCG AGC AGC CTG AAG GCC TCG GAC ACC GCC ATG 420
 121 K S I S T A Y L Q W S S L K A S D T A M 140
 421 TAT TAC TGT CCG AGA GTC TCT GCA TAT TGT AGT AGT ACC AGC TCC TAT GAC TAC TAC TAC 480
 141 Y Y C A R V S G Y C S S T S C Y D Y Y Y 160
 481 TAC TAC ATG GAC GTC TGG GCG CCG GCA ACC CTG GTC ACC CTC TCG AGA GGT GCA GCG GGT 540
 161 Y Y M D V W G R G T L V T V S R G G G C 180
 541 TCA GCG GCA GGT GCG TCT GCG GCG GCA TCG GAC ATC GTG ATG ACC CAG TCT CCT TCC 600
 181 S G G G G S G G G S D I V M T Q S P S 200
 601 ACC CTG TCT GCA TCT GTA GCA GAC AGA GTC ACC ATG ACT TCG CCG GCC AGT CAG AAC ATT 660
 201 T L S A S V G D R V T M T C R A S Q N I 220
 661 AAT ATC TCG TTC GCC TGG TAT CAG CAG AAA CCA GCG AAA GCC CTT AAG CTC CTG ATC TAT 720
 221 N I W L A W Y Q Q K P G K A P K L L I Y 240
 721 AAG GCG TCC ACT TTA CAG AGT GCG GTC CCG TCA AGC TTC ACC GCG AGT GCA TCT GCG ACA 780
 241 K A S T L E S G V P S R F S G S G S G T 260
 781 GAA TTC ACT CTC ACC ATC AGC GCC CTG CAG CCT GAT GAT TTT GCA AGT TAT TAC TGT CAA 840
 261 E F T L T I S G L Q P D D F A S Y Y C Q 280
 841 CCG TAT GAT AGT GAC TCG TCG TTC GCG CAA GCG ACC AAG CTG CAG ATC AAA CGT GCG GCC 900
 281 R Y D S D W S F G Q C T K L E I K R A A 300
 901 GCA TCG
 301 A S 302

Fig. 5